CHAPTER 5: RAIL SAFETY

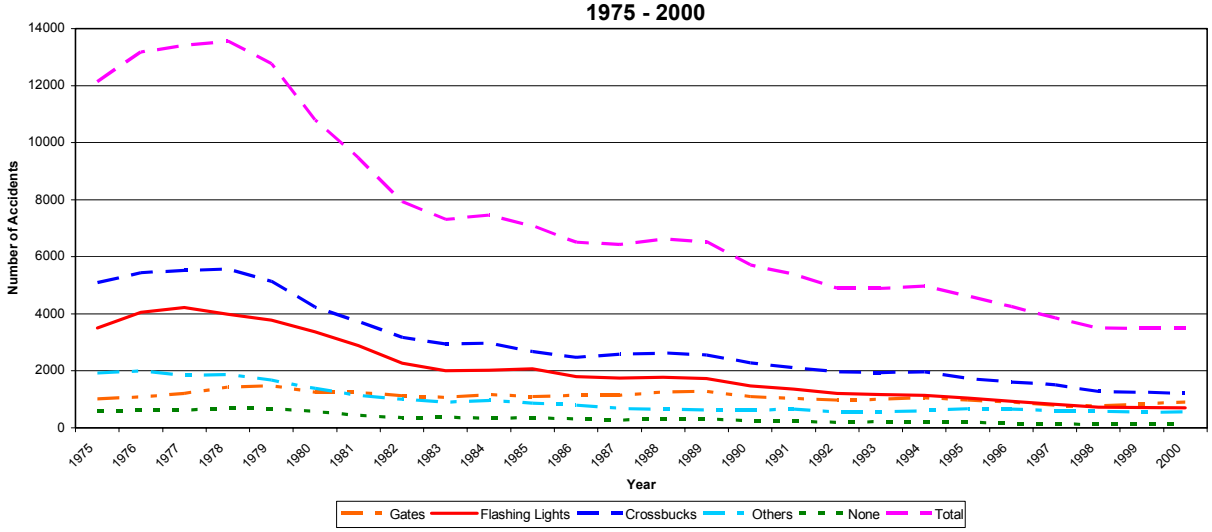
This chapter documents Kentucky's Rail Safety Program. The Program looks at general concerns regarding safety, accident statistics, problem types, Kentucky Grade Crossing Program, nationwide initiatives, and Kentucky's regulations, role, and policy. A focal point of the program is the relationship between the highway and rail networks, as related to highway-rail at-grade crossings.

I. GENERAL CONCERNS

Highway-rail grade crossing in South Union, Kentucky

The total United States rail system is comprised of over 122,000 miles of track. This system in 2000 was crossed at-grade by an estimated 256,000 streets, roads, highways, alleys, driveways, unimproved trails and other thoroughfares (equivalent to approximately 1.8 crossings per route mile of track) intended for the passage of motor vehicles, bicycles, and/or pedestrians. Only about 40 percent of these grade crossings have active warning devices with flashing lights, gates, bells, or some combination thereof. During the mid-1970s, there was an average of approximately 13,000 accidents and 1,000 fatalities per year at these crossings. As indicated in **Figure 5-1**, by the mid-1990s, these statistics had declined to an approximated average of 4,700 accidents and 575 fatalities per year. That represents a 64 percent reduction in accidents and a 42 percent decline in fatalities over the 20-year period, attributed mainly to the installation of active warning devices. In 2000, 3,502 accidents and 425 fatalities occurred at these crossings. These numbers represent a continual decreasing trend.

Figure 5-1
United States Highway-Rail Crossing
Accidents by Warning Device
1975 - 2000

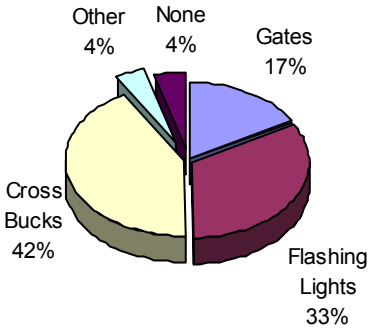


Source: Federal Railroad Administration Office of Safety

II. KENTUCKY RAIL CROSSING STATISTICS

In 2000, Kentucky's rail system was comprised of more than 2,800 route miles of track with 5,037 public and private at-grade crossings, equal to the national average with approximately 1.8 crossings per route mile of track. According to the Federal Railroad Administration's (FRA) Office of Safety, approximately 24 percent of these crossings are equipped with active warning devices, well below the national average. Kentucky Transportation Cabinet records show that there are 2,409 public at-grade crossings; therefore one-half are private crossings with passive warning devices. Approximately 17 percent are fully gated systems with gates, bells and flashing lights, as indicated in **Figure 5-2**.

Figure 5-2
Kentucky Public Highway-Rail Crossings by Warning Device for 2001
2,409 Total Crossings



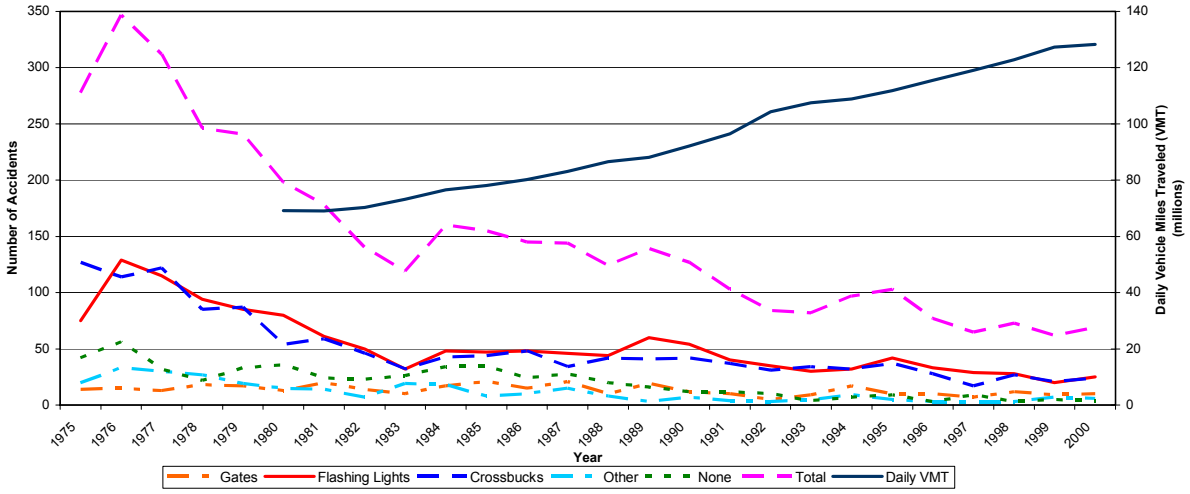
Source: Kentucky Transportation Cabinet

The number of grade crossing accidents in Kentucky has declined significantly since 1975. As shown in **Figure 5-3**, the total number of accidents has decreased from a high of 347 accidents in 1976 to 69 accidents in 2000. This is a result of improved warning devices at crossings, increased education, reduction in railroad route miles, and a decrease in the number of at-grade crossings, among others. The KYTC's Division of Multimodal Programs maintains data for daily vehicle miles of travel (DVMT), which is presented on Figure 5-3. Between 1980 and 2000, accidents have decreased by nearly 65 percent while DVMT has increased by 85 percent.

An example of a fully gated system on Rosemont Garden in Lexington, Kentucky

An example of an active warning system with flashing lights and bells along Brannon Road in rural Fayette County

Figure 5-3
Kentucky Highway-Rail Crossing
Accidents by Warning Type
1975 - 2000



Source: FRA Office of Safety and Division of Multimodal Programs

The FRA annually identifies the top 15 states with the highest number of incidents in the following categories: Highway-Rail Grade Crossing Fatalities, Highway-Rail Grade Crossing Injuries, Pedestrian Trespass Fatalities, and Pedestrian Trespass Injuries. The results are referred to as the "Focus 15" States and are based on Federal Railroad Administration Safety Statistics. For 2000, Kentucky was not in the top 15 for any of the four categories; however for 2001 the decreasing trend sharply rose in regard to the "Focus 15." In 2000, Kentucky had five highway-rail grade crossing fatalities and 20 highway-rail grade crossing injuries. In 2001, the number of fatalities doubled to 10 and injuries rose to 31. These increases placed Kentucky in the top 15 for both categories.

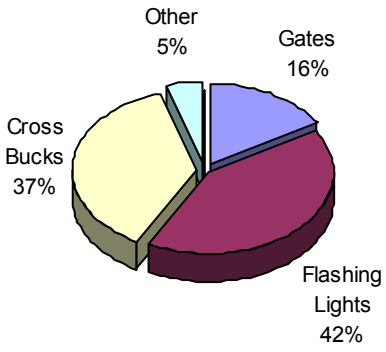
Another major rail safety concern is trespassing on railroad property. As stated in the *2000 Railroad Safety Statistics Annual Report*[1], a trespasser is defined as any person who is on that part of railroad property used in railroad operation and whose presence is prohibited, forbidden, or unlawful. In 2000, eight fatal and eight nonfatal casualties occurred as a result of trespassing in the Commonwealth of Kentucky, up from the previous year. In 2001, four fatal and eight nonfatal casualties occurred as a result of trespassing.

Due to the recent up and down trends of highway-rail grade crossing incidents and pedestrian trespass incidents, it would be desirable to regularly review the FRA Office of Safety statistics. The following FRA website can be used to track current and historical safety data: http://safetydata.fra.dot.gov/officeofsafety/.

[1] U.S. Department of Transportation, Federal Railroad Administration. *2000 Railroad Safety Statistics Annual Report*, July 2001.

Figure 5-4 shows Kentucky public highway-rail crossing incidents for 1999 by warning device. Although crossings equipped with flashing lights account for 33 percent of all public crossings, those crossings account for 42 percent of all incidents. Furthermore, highway-railroad crossings with fully gated systems account for 16 percent of all incidents. Although historical trends show a decrease in highway-railroad crossing incidents, active warning devices do not appear to eliminate incidents, but only to reduce the number.

Figure 5-4
Kentucky Public Highway-Rail Crossing Incidents for 1999 by Warning Device

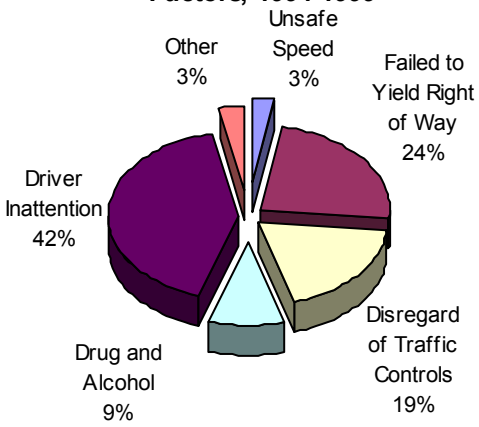


Source: FRA Office of Safety

Figure 5-5 details highway-rail at-grade crossing accidents by motorist action. According to the 1994 to 1999 editions of the *Kentucky Traffic Accident Facts*[2], the biggest contributor to crossing accidents was driver inattention, while the failure to yield right-of-way was the second biggest contributor. As seen in **Figure 5-5**, when looking at only fatal accidents, failure to yield right-of-way is the biggest contributor and disregard of traffic controls is the second largest at 24 percent.

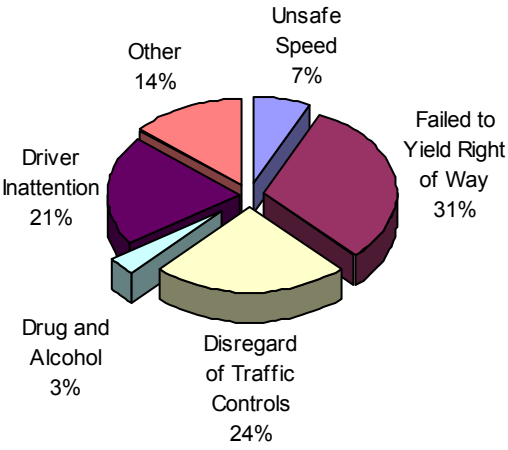
Figure 5-5

Kentucky Highway-Rail Crossing Accidents by Driver Contributing Factors, 1994-1999



Source: Kentucky Traffic Accident Facts

Kentucky Fatal Highway-Rail Crossing Accidents by Driver Contributing Factors, 1994-1999



Source: Kentucky Traffic Accident Facts

[2] Kentucky Transportation Center. *Kentucky Traffic Accident Facts*, published annually.

III. KENTUCKY GRADE CROSSING PROGRAM

The Highway-Railroad Grade Crossings Program funds highway-rail grade crossing improvements and was described on page 4-9. As stated previously, Kentucky annually receives $1.268 million to be administered through the Kentucky Transportation Cabinet Division of Right of Way and Utilities for rail-highway grade crossing improvements. This provides KYTC the ability to upgrade approximately eight to ten crossings per year.

The KYTC is required to maintain an inventory of public at-grade crossings throughout the Commonwealth. Based on physical characteristics and accident history, these crossings are prioritized. Approximately 2,000 of 2,409 are not fully upgraded to include gates, flashing lights, and bells. Therefore, these 2,000 public crossings are candidates for being upgraded under the Highway-Railroad Grade Crossings Program.

IV. KENTUCKY REVISED STATUTES (KRS) AND KENTUCKY ADMINISTRATIVE REGULATIONS (KAR)

Along with the aforementioned measures to improve grade crossing safety, KRS 189.561 charges the cabinet with the responsibility of investigating any public grade crossing that meets all of the following criteria:

- Not equipped with gates
- Carrying an average daily traffic of 4,000 or more
- Having 2 or more accidents within a consecutive 5-year period involving a train and a vehicle traversing the crossing (qualifying accidents are detailed in KAR 9:020)

Once a grade crossing is identified, and after receiving input from the affected local government supporting gate installation, the Cabinet programs the installation of gates. The cost of the gates is absorbed by the Cabinet and railroad, generally a 90% / 10% split, respectively. The cost is not charged to any unit of local government.

Not only can the Cabinet mandate necessary safety improvements, but it can also order any company owning or operating a railroad in the state to eliminate an at-grade crossing or change an existing overpass or underpass structure (as per KRS 177.120). Whenever the Cabinet considers the elimination of a crossing necessary for public safety, they can subsequently determine whether a substitute crossing should be established and what form that crossing takes (whether it be overpass or underpass).

As part of this KRS section, the Cabinet is given the responsibility of composing a list of grade crossings proposed to be closed. This list is comprised of redundant, and/or inherently dangerous grade crossings throughout the state.

The criterion for a crossing to be considered for closure is detailed in KAR 9:010, as follows:

- An alternate railroad crossing is available within one-quarter track mile in urban areas and the highway has a current average daily traffic count of 500 vehicles or less;

- An alternative railroad crossing is available within one track mile in rural areas and the roadway at crossing has a current average daily traffic count of 150 vehicles or less; or
- The railroad crossing has sight distance obstructions, or other layout characteristics which create unsafe conditions; closure of the railroad crossing is an economically preferable alternative to correcting the deficiencies at the site; and an alternate crossing is available.

The Cabinet must show warrant for closing any crossing. This is accomplished by working with and gathering input from public officials and railway companies.

The full text of the applicable KRS and KAR sections can be found in **Appendix F**.

V. PROBLEM TYPES AND LOCATIONS

At-grade crossings make up the largest contingent of rail accidents in Kentucky. In **Figure 5-6,** accidents over a 3-year period are mapped by location, and identified by severity, utilizing data maintained by KYTC as part of its Highway Information System. This data is based on filed police reports; however, this data does not contain the comprehensiveness that can be found in FRA data because of inaccuracies in the filing process. Figure 5-6 provides a general idea of problem at-grade crossings and locational groupings. Note that the accidents shown out of and away from a rail network are crossings of inactive or recreational lines.

In **Table 5-1** the 1996-2000 FRA data is used to identify locations of Kentucky's fatal rail crossing incidents. Five of the seventeen locations have no type of warning devices in place. During the four-year span contained in the table each location has had only one fatal accident. Only Hart and Lewis Counties have two different locations in which a fatal accident took place during that time period.

Table 5-1
Highway Rail Fatality Crossings in Kentucky
January 1996-December 2000

Crossing ID	County	Fatal Incidents	Total Deaths	Total Injuries	Railroad Code	Highway Name	Street Name	Crossing Type	Crossing Position	Warning Device Type	Highway AADT
343627J	Hart	1	3	0	CSX	CR 1253	GUTHRIE STREET	Public Vehicle	At Grade	Crossbucks	155
346942K	Muhlenberg	1	3	0	CSX	SR181		Public Vehicle	At Grade	Flashing Lights	1075
908596C	Todd	1	2	0	CSX			Private Vehicle	At Grade		
229173C	Lewis	1	1	2	CSX		PRIVATE ROAD	Private Vehicle	At Grade		
345396K	Henderson	1	1	1	CSX	SR 136	MADISON	Public Vehicle	At Grade	Flashing Lights	2610
229324P	Bracken	1	1	0	CSX	CITY	FRANKFORT	Public Vehicle	At Grade	Flashing Lights	1068
343576B	Hardin	1	1	0	CSX	SR1136		Public Vehicle	At Grade	Flashing Lights	1305
343613B	Hart	1	1	0	CSX		EDDIE SEGO RD	Public Vehicle	At Grade	Crossbucks	65
299213N	Hickman	1	1	0	IC	KY 1529		Public Vehicle	At Grade	Flashing Lights	200
345342E	Hopkins	1	1	0	CSX		W. MADISON STREET	Public Vehicle	At Grade	Crossbucks	150
345959K	Jefferson	1	1	0	CSX		WASHBURN	Public Vehicle	At Grade	Gates	2480
720022M	Kenton	1	1	0	NS			Private Vehicle	At Grade		
227064S	Lawrence	1	1	0	CSX	SR 3	MADISON	Public Vehicle	At Grade	Gates	10015
345889X	Lee	1	1	0	CSX	KY 1144	CENTER STREET	Public Vehicle	At Grade	Flashing Lights	1910
229215L	Lewis	1	1	0	CSX			Private Vehicle	At Grade		
841819A	McCreary	1	1	0	DOD		ROARING PAUNCH	Private Vehicle	At Grade		6
343763J	Simpson	1	1	0	CSX			Public Vehicle	At Grade	Gates	365
Total:		*17*	*22*	*3*							

Source: FRA

Legend

- Class I, Regional, and Short Line Railroads
- Interstate Highway
- Parkway

Railway Accidents

- Fatalities
- Non-Fatal
- Property

Active Rail Lines of Kentucky

Class I Railroads

Burlington Northern Santa Fe (BNSF)
Canadian Pacific Railway (CP)
CSX Transportation (CSXT)
Illinois Central (IC)
Norfolk Southern (NS)

Class II Railroads

Paducah and Louisville Railway (PAL)

Class III Railroads

Bluegrass Railroad (BLUE)
Fredonia Valley Railroad (FVRR)
Hardin Southern Railroad (HSRR)
Kentucky & Tennessee Railway (KT)
Kentucky, West Tennessee Railway (KWT)
Lexington & Ohio Railroad (LXOH)
Louisville and Indiana Railroad Company (LIRC)
R.J. Corman Railroad / Bardstown Line (RJCR)
R.J. Corman Railroad / Memphis Line (RJCM)
Tennken Railroad (TKEN)
Transkentucky Transportation Railroad (TTIS)
United States Government (USG)
Western Kentucky Railway (WKRL)

Louisville

1 0 1 2 3 Miles

N
W E
S

20 0 20 40 60 Miles

Source: Kentucky Transportation Cabinet Highway Information System Crash Data

EDUCATION PAYS

Wilbur Smith Associates

Figure 5-6

Highway-Rail Grade Crossing Collision Accidents 1996 - 1999

2002 Kentucky Statewide Rail Plan

VI. NATIONWIDE INITIATIVES

There are a number of national initiatives in place to improve rail safety. Operation Lifesaver, described below, is one of the most widely known and effective programs working to make both rail lines and highways safer. On the federal government level, the Federal Railroad Administration is responsible for rail safety, with its role described below. One topic, in particular, addressed in this section is the proposed legislation for locomotive horn use. The Louisville Quiet Zone is used as an example to show the benefits of quiet zone corridors, a key component of the proposal.

A. Operation Lifesaver

Operation Lifesaver is a nationwide, nonprofit organization dedicated to ending collisions, deaths, and injuries at highway-rail intersections and along railroad right-of-ways. It accomplishes its task through promoting the three E's: education, engineering, and enforcement. The public program is nationally funded by its many partners, including the United States Department of Transportation, the National Transportation Safety Board, law enforcement organizations, federal, state, and local governments, and the nation's railroads.

Kentucky's Operation Lifesaver Program is a volunteer organization funded by a number of state, local and private partners who participate in the program. The Commonwealth currently participates in Operation Lifesaver through its School Bus Driver Training, Safety Blitz, and Officers on Trains programs. Volunteers also participate in safety presentations at local schools, conventions and other activities such as the Kentucky Horse Park Southern Lights. The target audiences for these programs are railroad companies, law enforcement officers, bus drivers, and students. In 2001, Operation Lifesaver offered 532 presentations seen by over 47,000 people. These presentations included handouts on safety and enforcement, as well as a short video on the importance of railroad safety.

The success of Operation Lifesaver is seen through a decrease in fatalities and railroad-related injuries. Since its introduction in 1972, collisions at highway-rail intersections have been decreased by more than 65 percent. The current push by Operation Lifesaver is to continue to make groups across the state aware of the issues involving railroad safety. Recent actions have been taken to warn truck drivers and farmers through the Rural Safety Council. Other desired activities include public service announcements on the radio and advertising via billboards and electronic highway messaging boards. For additional information on Operation Lifesaver, the following website can be referenced: www.oli.org.

B. Federal Railroad Administration

By law, the Federal Railroad Administration (FRA) has the responsibility for ensuring railroad safety throughout the nation. To monitor railroad compliance with federally mandated safety standards, FRA employs approximately 400 inspectors operating out of 47 offices throughout the country. Regular inspections are conducted for compliance with safety regulations. The federal railroad safety regulations are found in Title 49, Code of Federal Regulations,

Parts 212 through 240. Each inspector records conditions below the minimum safety standards (defects). Should the defect not be corrected in a timely manner, or should it present an immediate safety hazard, penalties can be imposed.

Safety areas include:

- Motive Power and Equipment
- Track
- Signal and Train Control
- Operating Practices
- Highway Rail Crossings
- Hazardous Materials

Kentucky is in FRA's Region III, headquartered in Atlanta. Fred Dennin, 404/562-3800, is Regional Director.

Beginning in 1993, FRA reassessed its safety program to focus on results. The new Safety Assurance and Compliance Program (SACP) is intended to complement FRA's traditional safety enforcement program with a comprehensive approach in which SACP participants work with FRA to identify and correct root causes of problems across an entire railroad system.

FRA Proposed Rule

One key concern discussed earlier in the chapter is at-grade highway-rail crossings. The FRA is proposing a rule entitled *Use of Locomotive Horns at Highway-Rail Grade Crossings* to be included as part of the Code of Federal Regulations Title 49, Parts 222 and 229. It would require by law that a locomotive horn be sounded while a train is approaching and entering a public highway-rail crossing. In order to avoid the use of locomotive horns, two exceptions apply as follows:

- A circumstance where it is deemed there is not a significant risk of loss of life or serious personal injury; and
- A "quiet zone" where supplementary safety measures fully compensate for the absence of the warning provided by the horn.

Quiet zones are intended to give a community options to the sounding of locomotive horns. They can be established by implementing a set of approved supplementary safety measures or a combination of supplementary safety measures and alternative safety measures at each crossing along the "quiet zone" corridor. A "quiet zone" must be at least one-half mile in length, and all crossings within the corridor must, at a minimum, be equipped with gates and lights. Approved supplementary safety measures, as stated by the FRA, include the following:

- Four quadrant gates
- Medians or channelization devices at gated crossings

- Paired one-way streets
- Temporary closure such as nighttime periods
- Use of photo-enforcement technology

Approved alternative safety measures include the following:

- Variations of supplementary safety measures
- Long-term, programmatic law enforcement efforts and initiatives
- Targeted public education awareness efforts and initiatives

Louisville Quiet Zone

Working closely with the FRA, the City of Louisville, CSX Transportation and the KYTC created the first major quiet zone in the country. The corridor is located in Louisville, Kentucky along CSX Transportation's Louisville Division. The project area included 12 highway-rail grade crossings. According to the project website, http://www.louky.org/quietzone/home.htm, the project objectives included the following:

- Provide a highway/rail safety plan that will discontinue the use of locomotive horns;
- Close certain street and alley crossings;
- Improve safety at crossings not designated for closure; and
- Gain both residential and business support for the Louisville Quiet Zone.

In creating the Louisville Quiet Zone, the City of Louisville was able to close four street crossings and three alley crossings. In the process, the City of Louisville opened one new alley crossing, added cul de sacs to closed crossings, cut curbs and added bollards, and widened one street to accommodate two-way traffic. In addition, the project accommodated the existing pedestrian crossings, allowing each to remain open. Several sources of funding were utilized to successfully implement this project. Section 130 funds, City of Louisville General Funds, CSX Transportation, and the Commonwealth of Kentucky all contributed to the funding of the project, making this project a true example of a successful public-private partnership.

An example of an upgraded crossing along the Louisville Quiet Zone